PEER ADVERSITY AS A PREDICTOR OF INTERPERSONAL NEEDS IN ADOLESCENCE

BY

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Abstract

The need to belong (NTB) and need for approval (NFA) are fundamental interpersonal needs necessary for social development. Although these are universal needs, it is important to also acknowledge that there are individual differences in the strength of these needs. The aim of the present study was to bridge a gap in the existing research regarding where individual differences in interpersonal needs originate, with a specific focus on the impact of peer experiences. Specifically, we examined the contribution of lifetime peer adversity (e.g., victimization, peer rejection, friendlessness, friendship conflict, loss of a friend, and romantic conflict or rejection) and recent victimization to both general and situation-specific interpersonal needs. Results revealed that recent victimization predicted avoidance NFA, whereas a significant interaction between lifetime peer adversity and recent victimization predicted approach NFA. Although individual differences in general NTB were not significantly predicted by lifetime peer adversity or recent victimization, both predicted threats to interpersonal needs in the context of a laboratory manipulation of social exclusion. Specifically, both lifetime peer adversity and recent victimization predicted greater need-threat prior to the exclusion, but only individuals who had experienced lifetime peer adversity continued to display ongoing high levels of threatened interpersonal needs.

Keywords: Peer Adversity, Adolescence, Need to Belong, Need for Approval

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Peer Adversity as a Predictor of Interpersonal Needs in Adolescence

Interpersonal needs, such as the need to belong (NTB; i.e., the desire to form and maintain interpersonal attachments) and need for approval (NFA; i.e., the need for social acceptance), have been proposed as being fundamental to human development and social functioning (Baumeister & Leary, 1995; Crowne & Marlowe, 1960). Negative consequences to mental health (i.e., anxiety, loneliness, anger, anti-social behavior, social helplessness) have been demonstrated if interpersonal needs are not met (Baumeister & Tice, 1990; Leary, 1990; Mellor, Stokes, Firth, Hayashi, & Cummins, 2008; Peplau & Perlman, 1982; Rudolph & Bohn, 2014; Twenge, Baumeister, Tice, & Stucke, 2001; Williams, Shore & Grahe, 1998). Although these are universal needs, it is important to also acknowledge that there are individual differences in the strength of these needs. The general aim of the present study was to bridge a gap in the existing research regarding where individual differences in interpersonal needs originate, with a specific focus on the impact of peer experiences. Specifically, we examined whether exposure to lifetime peer adversity (e.g., victimization, peer rejection, friendlessness, friendship conflict, loss of a friend, and romantic conflict or rejection) and recent victimization contribute to the development of individual differences in these needs.

Interpersonal Needs

Need to belong. The belongingness hypothesis proposes there is an innate human need to belong and have social relatedness with others (Baumeister & Leary, 1995). Research has shown that this fundamental need extends to different societies and cultures across the globe (for a comprehensive review, see Williams, 1997). According to Baumeister and Leary (1995), in order to satisfy NTB, two criteria must be met: (1) stable, positive interactions with other people and (2) these interactions must involve mutual caring for each other's welfare. Baumeister and

Leary's (1995) theory suggests that NTB is a universal motivation that can lead to negative effects, such as maladjustment and increased stress arousal, when these criteria are not met.

To test the belongingness hypothesis, laboratory research has examined the influence of manipulated experiences of acute peer rejection on NTB (Gardner, Pickett, & Brewer, 2000; Pickett, Gardner, & Knowles, 2004). Gardner and colleagues (2000) manipulated individual perceptions of social exclusion through computer mediated chat rooms in which participants were either accepted or rejected by the computerized group members. After being asked to read the diary of another student containing positive and negative events, participants who had encountered social rejection recalled more social events than their accepted counterparts (Gardener et al., 2000). This finding may be in part due to an enhanced motivation to re-gain a sense of belonging through social processing of goal-relevant events.

Another common lab-manipulation paradigm used to study NTB and rejection is Cyberball: a virtual ball-tossing during which participants interact with other players (whose throws are controlled by a programmed computer) and are induced to either be included or excluded in the game (for a comprehensive meta-analysis of studies using Cyberball, see Hartgerink, van Beest, Wicherts, & Williams, 2015; Williams, Cheung, & Choi, 2000). To further examine the effects of exclusion, van Beest and Williams (2006) introduced the need-threat measure to assess how social rejection threatens four basic needs: belongingness, self-esteem, meaningful existence, and control (Williams, 2009). Studies that have incorporated the need-threat scale to assess the effects of Cyberball on individual needs (e.g., Williams, Cheung, & Choi, 2000; Zadro, Williams, & Richardson, 2004) report that induced rejection results in threats to feelings of belonging, lower self-esteem, meaningful existence, and control compared to included participants. An abundance of studies showing that feelings of belongingness suffer

across participants when they are socially rejected provide further indication that the NTB is a universal need and supports the need-threat model.

Despite being a general need across individuals, there are varying degrees to which individuals display NTB. Examining individual differences in NTB, Pickett et al. (2004) investigated whether NTB was associated with attention to, and decoding of, social cues. Participants were first asked to complete Leary et al.'s (2001) Need to Belong Scale (NTBS) and were then placed into one of three separate conditions: recalling times of either intense rejection, academic failure, or normal day-to-day activities. Based on Empathic Accuracy Tasks and Vocal Stroop Tasks, Pickett and colleagues (2004) found that participants in the rejection condition attended to social cues more than counterparts in other conditions. It was also found that individuals high in NTB across conditions exhibited greater interpersonal sensitivity, as reflected in the ability to identify vocal tone and facial expressions, and to exhibit empathic accuracy when asked to interpret other's emotions in social situations. These results highlight individual differences in NTB and suggest that both chronic and situationally induced belonging needs contribute to social sensitivity (Pickett et al., 2004).

In support of Baumeister and Leary's belongingness hypothesis, there is a substantial body of research demonstrating the potential negative consequences when an individual experiences a threat to their sense of belonging. A lack of belonging and stable relationships can have detrimental effects such as loneliness (Peplau & Perlman, 1982), anxiety (Baumeister & Tice, 1990; Leary, 1990), aggression (Twenge et al., 2001), or self-defeating behavior and social helplessness (Twenge, Catanese, & Baumeister, 2002). Research done by Tyler, Branch, and Kearns (2016) also found that individuals high in NTB are more sensitive to negative social interactions than individuals low in NTB. As a result, these negative social interactions lowered

their self-esteem and social involvement and harmed their view of healthy relationships. In sum, the extent to which a lack of belonging can be detrimental to mental and physical health provides further evidence that NTB is a fundamental drive.

Need for approval. Compared to the depth of research regarding NTB, NFA is a concept with less empirical attention. NFA is conceptualized as a reliance on social approval and appraisals by others in order to determine self-worth (Harter, Stocker, & Robinson, 1996). Rudolph, Caldwell, and Conley (2005) further distinguished this need as having two distinct dimensions: social approach, as reflected in the motivation to gain positive judgments (enhanced self-worth in the face of approval) and social avoidance, as reflected in the motivation to avoid negative judgments (low self-worth in the face of disapproval). Confirmatory factor analyses have validated this two-dimensional nature of NFA, revealing that social approach and social avoidance are distinct yet correlated factors (Rudolph et al., 2005).

Across development, NFA naturally tends to decrease as youth gain a more stable sense of self that is independent of the judgments of others (Harter, 1998). However, considering that adolescence is a period where there is an increased focus on peer relationships (Csikszentmihalyi & Larson, 1984; Masten et al., 2009), the influence of peer approval on self-worth is especially high during this time (Brown, 1990; Harter, 1998; Harter, Waters, & Whitesell, 1998). Individual differences in NFA may intensify during this time, such that some adolescents continue to demonstrate an overreliance on approval for their self-worth, resulting in a self-concept that fluctuates according to the views of others (Harter, Stocker, & Robinson, 1996). Consistent with these ideas, several theories of personality development implicate individual differences in contingent self-worth, as reflected in the extent to which individuals base their self-worth on approval or success in relationships (Blatt & Homann, 1992; Crocker & Wolfe, 2001; Fritz &

Helgeson, 1998). Supporting a distinction between NFA and global self-worth, confirmatory factor analyses reveal that NFA approach and NFA avoidance factors are distinct from a global self-worth factor (Rudolph et al., 2005).

According to NFA theory, the two dimensions of NFA (i.e., approach and avoidance motivations) likely have different implications for children's well-being. Youth who are motivated by social avoidance may spend more energy worrying about their social acceptance, perhaps leading to self-doubt, worry, and hopelessness, particularly when they receive negative social feedback (Rudolph et al., 2005). Consistent with this idea, these youth experience higher emotional distress and vulnerability to anxiety and depression. Some individuals with high avoidance NFA also show lower social competence and difficulties in relationships. In contrast, youth who are motivated by social approach may have higher social competence, perhaps due to approaching social situations cooperatively and in a prosocial manner in an attempt to receive positive feedback. Consistent with this theory, youth motivated by social approach are buffered against emotional distress (Rudolph et al., 2005). The demonstrated effects that approach NFA and avoidance NFA can have on a child's overall well-being support this construct as a fundamental interpersonal need.

Social Monitoring System (SMS)

Building on theories regarding NTB and NFA, sociometer theory proposes that individuals' self-esteem serves to monitor their environments for social acceptance, providing feedback when interpersonal needs are threatened (Leary, Tambor, Terdal, & Downs, 1995). In particular, Gardner and colleagues (Gardner, Pickett, & Brewer, 2000; Pickett, Gardner, & Knowles, 2004) suggest that an internal Social Monitoring System (SMS) monitors social environments to determine what will bring successful social opportunities to an individual. This

is done in 3 stages: (1) assessing current levels of social inclusion, (2) monitoring environments for social cues and opportunities, and (3) using the cues to initiate social interactions (Gardner et al., 2000). The SMS is essential to regulating NTB and NFA as it provides a mechanism to judge and guide social acceptance. Gardner et al. (2000) posit that when individuals experience threats to their social acceptance, they resort to "social snacking." Similar to snacking on food when one is hungry, individuals who partake in social snacking indulge any type of social interactions to feed their social hunger and bring their SMS back to equilibrium (Gardner et al., 2000). Despite work supporting the existence and function of the SMS (Gardner, Pickett, & Brewer, 2000; Pickett, Gardner, & Knowles, 2004), the cause of differing strengths in individual social hunger, or how an individual's SMS is calibrated to regulate NTB and NFA, is still unknown. The focus of the current study is to examine contributors to individual differences in the calibration of the SMS as reflected in the NTB and NFA.

Origins of Individual Differences: Peer Adversity

One possible explanation for individual differences in interpersonal needs is exposure to peer adversity. While some children enjoy friendships and are openly accepted by their peers, others may find themselves to be disliked, ostracized, and even physically abused. Consistent with the idea of the SMS (Gardner et al., 2000), it is possible that exposure to peer adversity will contribute to social sensitivity and lead to higher levels of NTB and NFA. As a result of lowered self-esteem and self-concept following exposure to peer adversity, individuals may become socially starved (Hawker & Boulton, 2000). Thus, in an attempt to feed their social hunger, the SMS may become more sensitive to cues of belongingness and approval (Gardner et al., 2000; Pickett et al., 2004). While the SMS can be adaptive in the short term, as it may help children improve their social interactions and relationships by enhancing their alertness to social cues, it

may not be as adaptive in instances of chronic peer adversity. When enduring peer adversity occurs, it may be more difficult for children to resolve social issues and fulfill their desire for belongingness and approval.

Although there is very little research regarding the impact of peer adversity on NTB and NFA, a meta-analysis by Hawker and Boulton (2000) provides evidence that children exposed to high levels of peer adversity in the form of victimization are at risk for psychological problems and detrimental effects on their global self-esteem and social self-concept. Similarly, Caldwell, Rudolph, Troop-Gordon, and Kim (2004) found that exposure to peer stress predicts negative self-appraisals over time. Salmivalli et al. (1996) suggest exposure to peer stress may lead to lower self-esteem because individuals internalize the victimization they face as the result of negative evaluations by their peers.

Exposure to social stress also has been found to predict high sensitivity to rejection (Rudolph et al., 2016). Rudolph and colleagues (2016) found that adolescent girls with a history of chronic victimization reported higher threats to their social needs after exclusion during Cyberball compared to non-victimized girls. These findings demonstrate that exposure to peer adversity can impact belongingness needs. Additionally, Zimmer-Gembeck, Trevaskis, Nesdale, and Downey (2014) found that adolescents who experience high levels of victimization have greater self-reported rejection sensitivity. A significant amount of research has supported the link between peer rejection and maladjustment later in life (for a comprehensive review, see McDougall, Hymel, Vaillancourt, & Mercer, 2001). These findings are consistent with the idea that adverse peer experiences may also promote a heightened NTB and NFA. Peer adversity thus warrants empirical investigation as it may have lasting negative effects on individual differences in interpersonal needs. The focus of the current study aimed to address this question.

Recent Victimization

According to a cumulative effects model of development (O'Connor, 2003), lifetime adversity may exert particularly potent long-term negative effects when these early experiences are reinforced by subsequent stressors. The cumulative effects model includes an additive effects variant (the effects of recent stressors add to the effects of earlier lifetime adversity) and an interactive effect variant (the effects of recent stressors depend on the history of earlier lifetime adversity). Thus, it is possible that lifetime peer adversity and more recent peer adversity contribute in an additive or interactive way to interpersonal needs.

A significant portion of the current research on adverse peer experiences has focused specifically on victimization and its related effects. Victimization is highly prevalent among adolescents (i.e., roughly 30-60% of students are victimized in a given year; Glover, Gough, Johnson, & Cartwright, 2000; Smith & Shu, 2000) and has been linked to numerous adjustment problems such as low self-esteem (Hawker & Boulton, 2000) and internalizing symptoms (i.e., depression, anxiety, loneliness; Card & Hodges, 2008; Storch & Ledley, 2005) as well as to fear of negative evaluation by peers and avoidance of social situations (Storch & Masia-Warner, 2004; Storch, Nock, Masia-Warner, & Barlas, 2003). Moreover, prior research has found that children with a history of peer adversity may be especially susceptible to future victimization (Salmivalli & Isaacs, 2005). To test the cumulative effects model, we considered the joint effects of lifetime adversity and recent victimization on individual differences in interpersonal needs in adolescence.

Study Overview

The present study examined the additive and interactive contributions of exposure to lifetime peer adversity and recent victimization to individual differences in interpersonal needs

during adolescence. We chose to examine adolescence because it is a critical period of development that is characterized by an increased focus on peer relationships (Csikszentmihalyi & Larson, 1984; Masten et al., 2009), greater value placed on peer approval (Brown, 1990), and greater concern about social rejection (Masten et al., 2009). During adolescence, peer rejection, isolation, and victimization are prominent social concerns (Coie, Dodge, & Kupersmidt, 1990; Juvonen, Graham, & Schuster, 2003). For the purpose of this investigation, peer adversity was operationalized using a comprehensive interview that assessed multiple indexes, including victimization, friendlessness, friendship conflict, loss of a friend, and romantic conflict or rejection. It is advantageous to investigate peer adversity collectively in order to comprehensively understand how a variety of adverse peer experiences may serve as an antecedent to individual differences in NTB and NFA.

In addition, this study focused specifically on adolescent girls. Given that prior research has demonstrated that girls show more emotional distress in response to difficulties in their relationships than boys (Rudolph, 2002), peer adversity may have more adverse consequences for girls' interpersonal needs. Girls have been found to develop more intimate friendships during adolescence than boys, and to experience more anxiety about being rejected by their peers (see Berndt, 1982). Additionally, research done by Paquette and Underwood (1999) has indicated that not only do girls recall experiencing more social aggression, they also report more negative thoughts and feelings than boys after such victimization. Based on this previous work, we thought that adolescent girls may be particularly vulnerable to heightened NTB and NFA after exposure to peer adversity.

Four main hypotheses were examined in the current research. Specifically, we predicted that: (1) exposure to lifetime peer adversity would predict higher NTB; (2) exposure to lifetime

peer adversity would predict higher levels of avoidance NFA and lower levels of approach NFA; (3) exposure to lifetime peer adversity and recent victimization would predict greater threat to interpersonal needs in the context of a laboratory social rejection adversity; and either (4) adolescents who experience high levels of lifetime peer and high levels of recent victimization would have the greatest impact to interpersonal needs (additive effects); or (5) the contribution of lifetime peer adversity to interpersonal needs would be stronger in those who experience high relative to low levels of recent victimization (interactive effects).

Method

Participants

Participants included 89 adolescent females between ages 14-17 (M = 15.85 years, SD= .89; 66.3% White, 21.3% African American, 4.5% Latina, 1.1% Asian, 6.7% other). Participants were recruited from schools in the Midwest region of the United States. Participants came from families with diverse socioeconomic backgrounds: 27.8% lower income [$0-$29,000], 24% middle income [$30,000-$59,000], and 46.7% middle to upper income [above $60,000]. Parents provided written consent and adolescents provided written assent. Participants received a monetary compensation.

Procedures

Participants came into the lab in the summer after 9th and 10th grade for two separate sessions. In one session, they independently completed self-report measures of the Need to Belong Scale (NTBS; Leary et al., 2001), Need for Approval Questionnaire (NFA; Rudolph et al., 2005), and an abbreviated version of the Social Experiences Questionnaire (SEQ; Rudolph, Troop-Gordon, Hessel, & Schmidt 2011). Additionally, participants completed Cyberball (Williams et al., 2000) while undergoing functional magnetic resonance imaging. The Need-

Threat Scale (van Beest & Williams, 2006) was administered before the scan, immediately after the scan, and 15-20 minutes after the scan. In another session, trained interviewers conducted a semi-structured interview assessing lifetime peer adversity These sessions were conducted within two weeks of one another.

Measures

Need to belong. The Need to Belong Subscale (NTBS; Leary et al., 2001) consists of 10 self-report items designed to capture belonging needs and the desire to be accepted by others (e.g., "I want other people to accept me."). Participants rated how true each item was on a 5-point Likert scale (1 = Not at All to 5 = Very Much). The average of all items was taken, with a higher score indicating a greater NTB.

Need for approval. The Need for Approval Questionnaire (NFA; Rudolph et al., 2005) consists of two subscales. The social approach subscale assesses the extent to which a child's self-worth is reliant on peer approval and acceptance (4 items; e.g., "Being liked by other kids makes me feel better about myself."). The avoidance subscale assesses the extent a child's self-worth is affected by peer disapproval and rejection (4 items; e.g., "I feel like I am a bad person when other kids don't like me."). For both subscales, participants rated how true each item was on a 5-point Likert scale (1 = Not at All to 5 = Very Much). The average of all items was taken from each subscale to create composite scores, with higher scores indicating greater approach and avoidance NFA.

Lifetime peer adversity. The Lifetime Adversity section of the Youth Life Stress Interview (YLSI; Rudolph et al., 2000) was used to assess adolescents' behavior and peer interactions. This interview measured peer stress through specific questions that assessed sub-categories of friendlessness (e.g., "Have you been left out/excluded when nobody liked you and

you didn't have any friends at all?"), friendship conflict (e.g., "Was there ever a time when you were having serious arguments/fights with your close friends that lasted for a long time?"), rejection (e.g., "Have you been left out/excluded by the rest of the kids at school for a long period of time, when no one wanted to play/hang out with you?"), victimization (e.g., "Was there ever a period of time when you were being severely bullied at school or outside of school?"), and romantic conflict (e.g., "Have you ever had serious problems (violence, extreme arguments) with someone you were dating?"). Based on the follow-up questions concerning the context, time, and duration of the stressor, interviewers then prepared a narrative summary of each event. This summary was presented to independent team of coders who had no prior knowledge of the youth or their life circumstances. The coders assigned a rating on a 10-point scale ranging from 1 (None) to 10 (Severe) to reflect their exposure to peer adversity across their lifetime up until the year prior to the interview (to prevent overlap with recent experiences).

Recent victimization. A novel abbreviated version of the Social Experiences Questionnaire (SEQ; Rudolph et al., 2011) was used to assess exposure to recent peer victimization. A prior version of the SEQ contained 21 questions and was later supplemented with an additional 5 cyber-victimization items. A factor analysis was run and items with the highest loading scores for verbal, relational, physical, and cyber victimization were used to create the new abbreviated version of the SEQ. This measure assesses 3 verbal victimization items (e.g., "How often does another kid insult you or put you down?"), 3 relational victimization items (e.g., "How often does a friend threaten to stop being your friend to hurt you or to get their way?"), 3 physical victimization items (e.g., "How often do you get hit, punched, or slapped by another kid?"), and 3 cybervictimization items (e.g., "How often has another kid made a threatening or aggressive comment to you online?"). Participants rated how true each

item was on a 5-point Likert scale (1 = Not at All to 5 = Very Often). The average of all items was taken to create a composite score with a higher score indicating greater exposure to peer victimization.

Need-threat. All participants completed the Need-Threat Scale (van Beest & Williams, 2006) before and after engaging in Cyberball (Williams et al., 2000). During Cyberball, participants were told they would be playing an on-line game with two peers who are in another room also completing the study. Throughout the game, a virtual ball was thrown back and forth among three players. When the participant received the ball, they returned it to either player by pushing one of two buttons. The throws of the other players were controlled by a programmed computer. Each participant completed two rounds. In the inclusion round, they were equally included in the ball-tosses. In the exclusion round, they were excluded after 10 ball-tosses.

The Need-Threat Scale consists of 12 self-report items assessing feelings of rejection (e.g., "I felt rejected"), belongingness (e.g., "I felt disconnected"), self-esteem (e.g., "I felt good about myself), and control (e.g., "I felt powerful"). Participants rated how true each item was on a 5-point Likert scale (1 = Not at All to 5 = Very Much). Consistent with prior research (Williams, Cheung, & Choi, 2000; Zadro, Williams, & Richardson, 2004), the average of all items was taken, with higher scores indicating greater threat to one's needs. Participants completed this scale directly before (Pre-scan), immediately following the scan (where they were asked to report how they felt while playing Cyberball; Post 1), and 20 minutes following the scan (Post 2).

Confirming the validity of Cyberball for eliciting threats to one's interpersonal needs, a multivariate repeated-measures analysis of variance was conducted with time (Pre-scan, Post 1, and Post 2) as a within-subject factor (see Figure 1). The analysis yielded a significant main

effect of time, $F(2, 174)= 30.13$, $p < 0.001$. Pairwise comparisons revealed a significant difference between Pre-Scan ($M= 2.25$, $SD= .08$) and Post 1 ($M= 2.70$, $SD= .08$) scores ($p < 0.001$) as well as between Post 1 ($M= 2.70$, $SD= .08$) and Post 2 ($M= 2.18$, $SD= .07$) ($p < 0.001$) scores but not between Pre-Scan ($M= 2.25$, $SD= .08$) and Post 2 ($M= 2.18$, $SD= .07$) scores ($p = .193$).

Results

Preliminary Analyses

Table 1 displays intercorrelations among the study variables. Consistent with prior research (Rudolph et al., 2005), approach NFA and avoidance NFA were found to be significantly positively correlated. There was also a significant positive correlation between NTB and approach and avoidance NFA. Given the positive correlation between approach and avoidance NFA, further analyses adjusted for the alternate dimension. The three need-threat scores were also significantly associated with each other. Need-threat scores at all three time points were also found to be significantly associated with NTB and avoidance NFA. Pre-scan and Post 2 had a significant negative correlation with approach NFA; however, the correlation between Post 1 and approach NFA was nonsignificant. Lifetime peer adversity was significantly correlated with recent victimization.

As expected, lifetime peer adversity was significantly positively correlated with avoidance NFA and negatively correlated with avoidance NFA however, it was not significantly correlated with NTB. Recent victimization was significantly associated with higher levels of avoidance NFA, but not with approach NFA or NTB. Lifetime peer adversity and recent victimization were significantly associated with need-threat at all three stages.

Overview of Analyses

To examine whether peer adversity predicts individual differences in interpersonal needs, a series of hierarchical multiple regression analyses was conducted to examine the independent and interactive contribution of lifetime peer adversity and recent victimization to individual differences in each index of interpersonal needs (i.e., NTB, approach NFA, avoidance NFA, need-threat levels at Pre-scan, Post 1, and Post 2). Interpersonal needs were predicted from lifetime peer adversity (entered at the first step), recent victimization (entered at the second step), and their interaction (entered at the third step). Both the predictors were standardized. Analyses predicting one dimension of NFA (approach or avoidance) adjusted for the alternate dimension. Analyses predicting Post 1 and Post 2 adjusted for previous assessments of need-threat. Significant interactions from the regressions were decomposed using simple slope analysis. Interactions were interpreted by solving the unstandardized regression equation to predict interpersonal needs from peer adversity at low (-1 SD) and high (+1 SD) levels of recent victimization.

Hypothesis Testing

NTB. Analyses examining NTB revealed nonsignificant main effects of lifetime peer adversity and recent victimization and a nonsignificant lifetime peer adversity x recent victimization interaction (see Table 2).

Approach NFA. Analyses examining approach NFA revealed a significant main effect of lifetime peer adversity, a nonsignificant main effect of recent victimization, and a significant lifetime peer adversity X recent victimization interaction (see Table 3). A decomposition of the lifetime peer adversity X recent victimization interaction was done with simple slope analysis (see Figure 2). As reflected in Figure 2, the nature of this interaction shows that exposure to high

levels of recent victimization suppresses approach NFA regardless of the exposure to lifetime peer adversity.

Avoidance NFA. Analyses examining avoidance NFA revealed a significant main effect of lifetime peer adversity at the first step. At the second step, there was a significant main effect of recent victimization and a nonsignificant lifetime peer adversity X recent victimization interaction at the third step (see Table 4). When recent victimization was added into the model, peer adversity was no longer a significant predictor of avoidance NFA. Thus, exposure to high levels of recent victimization significantly predicted high levels of avoidance NFA, above and beyond lifetime peer adversity.

Need-threat. Analyses examining Pre-scan need-threat revealed significant main effects of lifetime peer adversity and recent victimization and a nonsignificant lifetime peer adversity X recent victimization interaction (see Table 5). As displayed in Table 5, exposure to lifetime peer adversity and recent victimization predicted how threatened adolescent girls reported their needs to be prior to Cyberball.

Analyses examining Post 1 need-threat revealed nonsignificant main effects of lifetime peer adversity and recent victimization and a nonsignificant lifetime peer adversity X recent victimization interaction (see Table 6).

Analyses examining Post 2 need-threat revealed a significant main effect of lifetime peer adversity, a nonsignificant main effect of recent victimization, and a nonsignificant lifetime peer adversity X recent victimization interaction (see Table 7). Thus, lifetime peer adversity was the main predictor of how threatened needs remained following Cyberball.

Discussion

Overall, the aim of the current study was to examine the additive and interactive contribution of lifetime peer adversity and recent victimization to both general and situation-specific interpersonal needs. We found support for both an additive and interaction model, as well as some unique predictions of interpersonal needs by lifetime peer adversity or recent victimization.

The Contribution of Lifetime Peer Adversity and Recent Victimization to NFA

Avoidance NFA. The current findings indicate that exposure to adverse peer experiences significantly predicts avoidance NFA. While both lifetime peer adversity and recent victimization were found to be significant predictors, recent victimization seems to largely account for the effect of lifetime adversity, which became nonsignificant once recent victimization was entered into the model. This is a unique finding as it follows neither the additive or interactive variants of the cumulative effects model (O'Connor, 2003). It is possible the more immediate and pressing negative effects of recent victimization result in adolescents more readily avoiding negative judgements from their peers. This is consistent with previous research supporting the notion that exposure to high levels of victimization can result in lower self-esteem (Hawker & Boulton, 2000) and high sensitivity to rejection (Rudolph et al., 2016), which may help to explain the heightened levels of avoidance NFA.

Considering that peer approval plays an influential role in self-worth during adolescence (Brown, 1990; Harter, 1998; Harter, Waters, & Whitesell, 1998), the detrimental effect of recent victimization on avoidance NFA may have negative implications for social development. As the heightened need to avoid negative peer judgements is reinforced through exposure to peer adversity, these adolescents are at risk for emotional distress, self-doubt, worry, and lower social competence (Rudolph et al., 2005). The observed association between exposure to recent

victimization and heightened avoidance NFA highlights a risk factor and potential point of intervention for those exposed to victimization.

Approach NFA. As suggested by the interactive variant of the cumulative effects model (O'Connor, 2003), approach NFA was predicted by the interaction between lifetime peer adversity and recent victimization. Based on the decomposition of this interaction, the effects of lifetime adversity are dependent on recent victimization levels (high vs. low). However, inconsistent with cumulative effects model (O'Connor, 2003), a slightly different pattern emerged. Results revealed that experiencing high recent victimization most strongly predicts low approach NFA for individuals at low levels of peer adversity rather than high. Thus, it appears that the effects of recent peer stress results in low levels of NFA regardless of a history of high peer adversity levels. As a result of this interaction, adolescents who experience recent victimization face risk of low approach NFA.

This interaction between lifetime peer adversity and recent victimization highlights the harmful effect exposure to peer adversity can have on adolescents' approach NFA and social competence. Considering that the motivation to receive positive peer judgement has shown to be a buffer against emotional distress (Rudolph et al., 2005), exposure to peer adversity negatively impacts adolescents by lowering approach NFA scores. Lowered approach NFA then removes the protective emotional buffer, which may in turn impact their motivation to approach peers. Therefore, adolescents impacted by peer adversity and recent victimization may be most vulnerable to risk of social maladjustment.

The Contribution of Lifetime Peer Adversity and Recent Victimization to Need-Threat

The current study also examined the impact of peer adversity on situational interpersonal needs. Based on previous research (Rudolph et al., 2016), we expected that there would be a

greater threat to interpersonal needs in the context of a laboratory manipulation for adolescents with a history of peer adversity. Unexpectedly, the effects of lifetime peer adversity and recent victimization appeared to differ across a lab manipulation: before Cyberball, immediately after the scan when asked to report feelings during Cyberball, and 15-20 minutes after the scan.

As expected, both lifetime peer adversity and recent victimization were found to be significant predictors of threatened needs prior to Cyberball. This finding is supportive of an additive variant of the cumulative effects model (O'Connor, 2003) as the effects of recent stressors add to the effects of earlier lifetime adversity. Adolescents who are exposed to both a history of peer adversity as well as recent victimization are likely to feel as though their needs are threatened, even in the absence of a current social stressor. This finding is also consistent with SMS theory (Gardner, Pickett, & Brewer, 2000; Pickett, Gardner, & Knowles, 2004), as long-term exposure to adversity causes increased social hunger due to consistent threats to social acceptance. As a result, adolescents feel as though their needs are continuously threatened.

Immediately following exposure to Cyberball (Post 1), when adjusting for the previous time point, neither lifetime peer adversity nor recent victimization were found to predict threatened needs during the Cyberball manipulation. While we did not explicitly predict this finding, it may be due to Cyberball, on average, increasing participants' need-threat scores, regardless of past exposure to peer stress. Prior studies report that the induced rejection of Cyberball results in lowered feelings of belongingness across participants (i.e., Williams, Cheung, & Choi, 2000; Zadro, Williams, & Richardson, 2004). As a result of Cyberball threatening interpersonal needs, it is possible that the immediate and pronounced effects of Cyberball negate past effects of peer stress. Future research will be necessary to determine the

accuracy of these interpretations as to why peer adversity did not predict need-threat scores during Cyberball.

Unlike the two previous time points, lifetime peer adversity was found to be the only significant predictor of need-threat scores 20-minutes after Cyberball (Post 2), when adjusting for both earlier time points. This is a unique finding, not predicted by the cumulative effects model, as the effects of recent victimization on need-threat scores seen at Pre-scan are no longer present following Cyberball. Considering the effects of the situationally induced rejection are expected to have dissipated after 15-20 minutes, it appears having a history of lifetime adversity continually predicts elevated threats to their needs.

Lifetime peer adversity may primarily dominate threatened needs at Post 2 due to the long-lasting effects peer stress can have on the SMS (Gardner, Pickett, & Brewer, 2000; Pickett, Gardner, & Knowles, 2004). Long-term adversity overwhelms the SMS and makes it difficult for interpersonal needs to return to a point of equilibrium. Past research on the association between peer stress and attention to social cues (Gardener et al., 2000; Pickett et al., 2004) has found that individuals exposed to peer adversity attend to more social cues and socially relevant information. Therefore, continued stress and prolonged social hunger may impact how individuals interpret social cues and view them as threats to interpersonal needs.

The current findings regarding the effects of lifetime peer adversity on need-threat scores post-Cyberball expands existing research by showing the important role that prolonged peer stress can have on how youth interpret their social environment. This research also raises the question as to why a history of peer adversity continues to threaten interpersonal needs, while exposure to recent victimization does not. It is possible the negative implications for social development associated with chronic peer adversity affect adolescents on a deeper, more

continuous level than the more immediate and pressing effects of recent victimization that fade over time.

The Contribution of Lifetime Peer Adversity and Recent Victimization to NTB

Although lifetime peer adversity and recent victimization predicted individual differences in situation-specific threats to interpersonal needs, including the need to belong, they were not significant predictors of general NTB.

The stress of exclusion presented immediately by Cyberball appears to result in continually threatened levels of belongingness needs over a short period of time in adolescence exposed to higher levels of lifetime adversity. It would be advantageous for future work to not only potentially replicate these findings, but specifically investigate why peer adversity may only affect situationally specific NTB.

Strengths, Limitations, and Future Directions

This research makes a novel and important contribution to a growing body of research examining NTB and NFA and threats to these interpersonal needs. The current study was the first to identify a comprehensive index of peer adversity as antecedent to unfavorable individual differences in interpersonal needs (most notably impacting dimensions of NFA). The detrimental impacts on both dimensions of NFA must be added to a continually growing list of adverse social implications following peer adversity.

Despite these strengths, this research does not come without limitations. First, we relied solely on self-report measures and interviews. While first-hand accounts are most important when examining the effect peer adversity has on an individual's interpersonal needs, use of teacher-reports and peer-reports would be beneficial in providing reliability and validity to the data collected regarding peer experiences.

Additionally, this research focused the investigation on the effects of early peer adversity during adolescence. In order for the long-lasting effects of peer adversity to be understood, further research needs to examine the effects that long-term, chronic peer adversity has on interpersonal needs throughout the lifespan. Additionally, considering that NTB and NFA are universal human needs (Baumeister & Leary, 1995; Harter, Stocker, & Robinson, 1996), the study of peer adversity as an antecedent to individual differences in NTB and NFA should also be expanded to investigate the effects among adolescent boys. Considering that boys recall less social aggression and report fewer negative feelings after peer stress (Paquette & Underwood, 1999), it is most likely that exposure to peer adversity will have different effects on interpersonal needs for boys than it does for girls. Expanding this research to a more diverse population including adolescent boys would provide vital information regarding the negative effects that adverse peer interactions may have on social development in both genders.

Lastly, future research on individual differences in NTB may help to explain our nonsignificant findings. While we did find that situationally induced belonging needs were affected by peer adversity, it is still unclear why peer adversity did not also predict general NTB outside of lab manipulation. Future studies may provide further evidence to explain the relationship between exposure to peer stress and individual differences in NTB.

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Table 1. *Correlations between NFA, NTB, Need-threat Pre-Scan, Need-threat Post Scan 1, Need-threat Post Scan 2, Overall Victimization, and Lifetime Peer Adversity*

Variable	Mean (SD)	1	2	3	4	5	6	7	8
1. Lifetime Peer Adversity	2.92(1.96)								
2. Recent Victimization	1.54(.58)	.33**							
3. NTB	3.09(.65)	-.01	.08						
4. Avoidance NFA	1.84(.92)	.22*	.33**	.08					
5. Approach NFA	2.92(.99)	-.26*	-.19	.30**	.58**				
6. NT Pre-Scan	2.25(.76)	-.33**	.47**	.21*	.49**	-.31**			
7. NT Post Scan 1	2.70(.71)	.50	.23**	.27*	.29**	.07	.50**		
8. NT Post Scan 2	2.18(.68)	.41**	.38**	.35**	.45**	-.24*	.78**	.39**	

Note: Partial correlations were run with Avoidance NFA and Approach NFA
**p< .05, ** p <.01.*

Table 2. *Predicting NTB from lifetime peer adversity, overall victimization, and lifetime peer adversity* X *overall victimization interaction*

		Predictors	β	t	ΔR^2
Adolescent girls (n=89)	Step 1.	Lifetime peer adversity	-.01	-.12	.00
	Step 2.	Lifetime peer adversity	-.04	-.38	
		Recent victimization	.09	.82	.01
	Step 3.	Lifetime peer adversity	-.05	-.44	
		Recent victimization	.00	.02	
		Lifetime peer adversity X Recent victimization	.20	1.66	.03

**P< .05. ** p <.01.*

Table 3. *Predicting Approach NFA from lifetime peer adversity, overall victimization, and lifetime peer adversity* X *recent victimization interaction*

		Predictors	β	t	ΔR^2
Adolescent girls (n=89)	Step 1.	Avoidance NFA	.58	6.65*	.34
	Step 2.	Avoidance NFA	.60	7.02*	
		Lifetime peer adversity	-.21	-2.45*	.04
	Step 3.	Avoidance NFA	.63	7.08*	
		Lifetime peer adversity	-.18	-1.96	
		Recent victimization	-.11	-1.13	.01
	Step 4.	Avoidance NFA	.61	7.07*	
		Lifetime peer adversity	-.18	-2.10*	
		Recent victimization	-.21	-2.10*	
		Lifetime peer adversity X Recent victimization	.24	2.54*	.04

**p< .05. ** p <.01.*

Table 4. *Predicting Avoidance NFA from lifetime peer adversity, overall victimization, and lifetime peer adversity* X *recent victimization interaction*

		Predictors	β	t	ΔR^2
Adolescent girls (n=89)	Step 1.	Approach NFA	.58	6.65*	.34
	Step 2.	Approach NFA	.61	7.02*	
		Lifetime peer adversity	.18	2.10*	.03
	Step 3.	Approach NFA	.59	7.08*	
		Lifetime peer adversity	.10	1.13	
		Recent victimization	.24	2.71**	.05
	Step 4.	Approach NFA	.62	7.07*	
		Lifetime peer adversity	.11	1.20	
		Recent victimization	.28	2.83**	
		Lifetime peer adversity X Recent victimization	-.09	-.91	.01

**p< .05. ** p <.01.*

Table 5. *Predicting Need-threat Pre-Scan from lifetime peer adversity, overall victimization, and lifetime peer adversity* X *recent victimization interaction*

		Predictors	β	t	ΔR^2
Adolescent girls (n=89)	Step 1.	Lifetime peer adversity	.33	3.26**	.11
	Step 2.	Lifetime peer adversity	.20	1.98*	
		Recent victimization	.40	4.07**	.14
	Step 3.	Lifetime peer adversity	.19	1.96	
		Recent victimization	.37	3.34**	
		Lifetime peer adversity X Recent victimization	.07	.70	.00

**P< .05. ** p <.01.*

Table 6. *Predicting Post Scan 1 from lifetime peer adversity, overall victimization, and lifetime peer adversity* X *recent victimization interaction*

		Predictors	β	t	ΔR^2
Adolescent girls (n=89)	Step 1.	NT Pre-Scan	.49	5.20**	.24
	Step 2.	NT Pre-Scan	.53	5.34**	
		Lifetime peer adversity	-.12	-1.26	.01
	Step 3.	NT Pre-Scan	.53	4.89**	
		Lifetime peer adversity	-.12	-1.20	
		Recent victimization	-.01	-.09	.00
	Step 4.	NT Pre-Scan	.53	4.81**	
		Lifetime peer adversity	-.12	-1.21	
		Recent victimization	-.04	-.35	
		Lifetime peer adversity X Recent victimization	.07	.69	.00

**p< .05. ** p <.01.*

Table 7. *Predicting Post Scan 2 from lifetime peer adversity, overall victimization, and lifetime peer adversity* X *recent victimization interaction*

		Predictors	β	t	ΔR^2
Adolescent girls (n=88)	Step 1.	NT Pre-Scan	.78	11.40**	.60
	Step 2.	NT Pre-Scan	.77	9.82**	
		NT Post Scan 1	.01	.17	.00
	Step 3.	NT Pre-Scan	.70	8.57**	
		NT Post Scan 1	.04	.51	
		Lifetime peer adversity	.18	2.45*	.03
	Step 4.	NT Pre-Scan	.71	8.07**	
		NT Post Scan 1	.04	.49	
		Lifetime peer adversity	.18	2.48*	
		Recent victimization	-.04	-.47	.00
	Step 5.	NT Pre-Scan	.71	8.02**	
		NT Post Scan 1	.04	.45	
		Lifetime peer adversity	.18	2.46*	
		Recent victimization	-.06	-.64	
		Lifetime peer adversity X Recent victimization	.04	.56	.00

**p< .05. ** p <.01.*

Figures

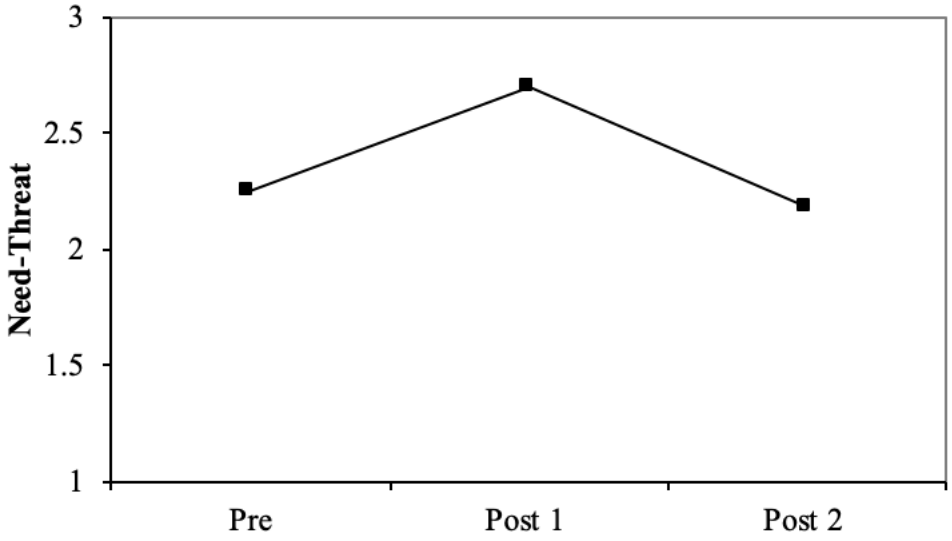

Figure 1. Representation of the multivariate repeated-measures analysis of variance pairwise comparison between Need-threat Pre-Scan, Post 1, and Post 2.

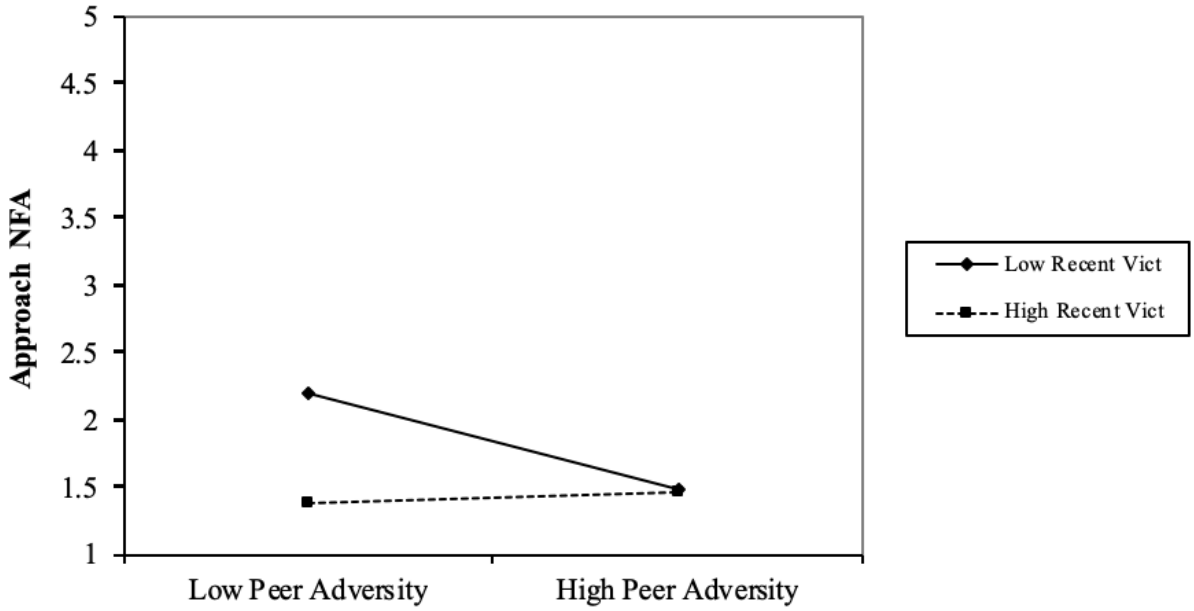

Figure 2. Lifetime peer adversity X recent victimization interaction in the prediction of approach NFA. The analyses adjusted for avoidance NFA.